UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,994	05/17/2007	James Robert Smith	M04B113	7073

71134 7590 11/10/2011

Edwards Vacuum, Inc.
2041 MISSION COLLEGE BOULEVARD
SUITE 260
SANTA CLARA, CA 95054

EXAMINER	
RAPHAEL, COLLEEN M	
ART UNIT	PAPER NUMBER
1724	

NOTIFICATION DATE	DELIVERY MODE
11/10/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LORETTA.SANDOVAL@EDWARDSVACUUM.COM

Office Action Summary	Application No.	Applicant(s)	
	10/589,994	SMITH ET AL.	
	Examiner	Art Unit	
	COLLEEN M. RAPHAEL	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1,2,4,6-16,18,20-25,27-52 and 54-65* is/are pending in the application.

5a) Of the above claim(s) *39-48* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,2,4,6-16,18,20-25,27-38,49-52 and 54-65* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☒ Claim(s) *1,2,4,6-16,18,20-25,27-52 and 54-65* are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 1, 2, 4, 6-16, 18, 20-25, 27-52 and 54-65 are current in the application. Claims 1, 2, 4, 6-16, 18, 20-25, 27-38, 49-52, and 54-65 are currently under examination. Claims 39-48 have been withdrawn as subject to a restriction requirement. Claims 3, 5, 17, 19, 26, and 53 have been cancelled by Applicant.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 4, 9-12, 15-16, 18, 23, 27-29, 36-38, 49, 54-56, and 63-65 are rejected under 35 U.S.C. 102(e) as being anticipated by Mahawili (US 6,617,538 B1).

3. Regarding claim 1, Mahawili teaches a method of treating a fluorocompound-containing gas stream, the method comprising: generating a plasma stream from a plasma source gas (Fig. 1, part 28, col. 4, lines 35-45); injecting the plasma stream through an aperture into a chamber(Fig. 1, parts 28 and 16, col. 4, lines 35-45); conveying to the plasma stream a source of ions for contacting the plasma stream to form heated ions comprising ions selected from the group consisting of OH- and H+ (e.g. water or hydrogenated compounds) (col. 5, lines 30-34); and conveying the fluorocompound-containing gas stream (col. 3, lines 55-58) to the heated ions, wherein the step of generating the plasma stream from a plasma source gas further comprises generating an electric field between two electrodes of a plasma torch and conveying the plasma source gas between the electrodes to form the plasma stream, and wherein the aperture is formed in one of the electrodes. (Fig. 1, parts 12, 14, 22, 24, 18, 20, col. 4, lines 1-31 and lines 46-67) Therefore, the method of Mahawili anticipates the method of claim 1.

4. Regarding claim 15, Mahawili teaches a method of treating a fluorocompound-containing gas stream, the method comprising: generating a plasma stream from a plasma source gas (col. 4, lines 32-45); adding the fluorocompound-containing gas stream to the plasma stream (col. 4, lines 46-53); injecting the plasma stream and gas stream through an aperture into a chamber (Fig. 1, part 42, col. 5, lines 42-46); and conveying to the plasma stream a source of ions comprising ions selected from the group consisting of OH- and H+ (e.g. water or hydrogenated compounds) (col. 5, lines 30-34 and 46-54); and conveying the fluorocompound-containing gas stream (col. 3, lines 55-58) to the heated ions, wherein the step of generating the plasma stream from a plasma source gas further comprises generating an electric field between two electrodes of a plasma torch and conveying the plasma source gas between the electrodes to form the plasma stream, and wherein the aperture is formed in one of the electrodes. (Fig. 1, parts 12, 14, 22, 24, 18, 20, col. 4, lines 1-31 and lines 46-67) Therefore, the method of Mahawili anticipates the method of claim 15.

5. Regarding claims 2, 16, and 49, Mahawili teaches that the plasma source gas comprises an inert ionizable gas (e.g. argon or nitrogen). (col. 4, lines 35-37)

6. Regarding claims 4 and 18, Mahawili teaches that the anode forms at least part of a wall of the chamber. (Fig. 1, part 14, col. 3, lines 59-61 and col. 5, lines 30-41)

7. Regarding claims 9-10, Mahawili teaches that the source of ions is conveyed to the chamber, and that the source of ions may be conveyed into the chamber separately from the fluorocompound-containing gas stream. (col. 5, lines 30-41)

8. Regarding claim 11, Mahawili teaches that the fluorocompound-containing gas stream may be conveyed directly to the chamber for reacting with the heated ions therein. (col. 4, lines 46-53)

9. Regarding claim 12, Mahawili teaches that the fluorocompound-containing gas stream may be conveyed to the chamber separately from the plasma stream. (col. 4, lines 46-53)

10. Regarding claim 23, Mahawili teaches that the source of ions is conveyed to the plasma stream injected into the chamber. (col. 5, lines 42-54)

11. Regarding claims 27 and 54, Mahawili teaches that the source of ions comprises water. (col. 5, lines 31-34)

12. Regarding claims 28, 29, 55, and 56, Mahawili teaches that the source of ions may comprise oxygenated compounds or hydrogenated compounds (where the Examiner is construing oxygenated compounds as comprising an alcohol selected from the group consisting of methanol, ethanol, propanol, propan-2-ol and butanol, and hydrogenated compounds as comprising a hydrogen-containing compound selected from the group consisting of hydrogen gas, a hydrocarbon, ammonia, and a paraffin) (col. 5, lines 31-32)

13. Regarding claims 36, 37, 63, and 64, Mahawili teaches that the gas stream is conveyed from the chamber for further processing, e.g. an acid or alkali wash (which the Examiner is construing as a wet scrubber ore a reactive media). (col. 5, lines 54-56)

14. Regarding claims 38 and 65, Mahawili teaches that the fluorocompound-containing gas stream comprises a perfluorocompound selected from the group consisting of CF_4, C_2F_6, CHF_3, C_3F_8, C_4F_8, NF_3 and SF_6. (col. 3, lines 55-56 and col. 7, lines 35-36)

Claim Rejections - 35 USC § 103

15. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 6-8, 13-14, 20-22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahawili (US 6,617,538 B1) in view of Bhatnagar.

18. Regarding claims 6-8 and 20-22, Mahawili is applied as above.

19. Mahawili does not explicitly teach that that the step of conveying to the plasma stream a source of ions may occur prior to the step of injecting the plasma stream through an aperture into the chamber, and that the step of conveying to the plasma stream the source of ions may further comprise conveying the source of ions in a stream comprising the plasma source gas, or that the source of ions is conveyed to the plasma stream separately from the plasma source gas

20. Bhatnagar et al teaches that the step of conveying to the plasma stream a source of ions may occur prior to the step of injecting the plasma stream through an aperture into the chamber (col. 10, lines 18-21), and that the step of conveying to the plasma stream the source of ions may further comprise conveying the source of ions in a stream comprising the plasma source gas (col. 10, lines 28-32), or that the source of ions is conveyed to the plasma stream separately from the plasma source gas. (col. 10, lines 33-37) Bhatnagar et al teaches that this increases the abatement efficiency. (col. 10, lines 25-27)

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by conveying the source of ions to the plasma stream xxx as taught by Bhatnagar et al, because this would increase the abatement efficiency. (see Bhatnagar et al, col. 10, lines 25-27)

21. Regarding claim 13, Mahawili is applied as above.

22. Mahawili does not explicitly teach that the gas stream may be conveyed to the heated ions through the plasma stream.

23. Bhatnagar et al teaches that the gas stream may be conveyed to the heated ions through the plasma stream. (Fig. 4, parts 235 and 240, col. 10, lines 15-17 and 48-53) Bhatnagar et al teaches that by selecting the volumetric flow ratio of reactive gas to PFC gas in the effluent, that the PFC reduction efficiency can be substantially improved. (col. 10, lines 64-67)

24. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by conveying the gas stream to the heated ions through the plasma stream as taught by Bhatnagar et al, because by selecting the volumetric flow ratio of reactive gas to PFC gas in the effluent, the PFC reduction efficiency can be substantially improved. (see Bhatnagar et al, col. 10, lines 64-67)

25. Regarding claim 14, Mahawili is applied as above.

26. Bhatnagar et al teaches that the gas stream may be conveyed to the plasma stream for injection into the chamber therewith. (col. 10, lines 27-30) Bhatnagar et al teaches that by selecting the volumetric flow ratio of reactive gas to PFC gas in the effluent, that the PFC reduction efficiency can be substantially improved. (col. 10, lines 64-67)

27. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by conveying the gas stream to the plasma stream for injection into the chamber as taught by Bhatnagar et al, because by selecting the volumetric flow ratio of reactive gas to PFC gas in the effluent, the PFC reduction efficiency can be substantially improved. (see Bhatnagar et al, col. 10, lines 64-67)

28. Regarding claim 24, Bhatnagar et al teaches that the source of ions may be conveyed to the plasma stream within the gas stream. (Fig. 2, parts 85, 100, and 235, col. 13, lines 51-54) Bhatnagar et al teaches that by selecting the volumetric flow ratio of reactive gas to PFC gas in the effluent, that the PFC reduction efficiency can be substantially improved. (col. 10, lines 64-67)

29. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by conveying the source of ions to the plasma stream within the gas stream as taught by Bhatnagar et al, because by selecting the volumetric flow ratio of reactive gas to PFC gas in the effluent, the PFC reduction efficiency can be substantially improved. (see Bhatnagar et al, col. 10, lines 64-67)

30. Claims 25 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahawili in view of Uhm (US Pat. Pub. 2003/0000823 A1).

31. Regarding claims 25 and 51, Mahawili is applied as above.

32. Mahawili is silent as to the pressure the plasma stream is generated at.

33. Uhm teaches a method of using an atmospheric plasma torch for decomposition of PFC gases. (para. 0008, lines 1-14) Uhm teaches that this allows destruction of tetrafluoromethane without vacuum pump assistance. (para. 0008, lines 14-17)

34. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by using a plasma stream generated at atmospheric pressure as taught by Uhm, because this would allow destruction of tetrafluoromethane without vacuum pump assistance. (para. 0008, lines 14-17)

35. Claims 33, 50, 52, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahawili in view of Kim et al (IEEE 1995).

36. Regarding claims 50 and 52, Mahawili is applied as above.

37. Mahawili is silent as to the pressure the plasma stream is generated at.

38. Kim et al teaches a thermal plasma where the plasma stream/jet is generated at a low pressure, i.e. a pressure below atmospheric pressure. (p. 855, left col., Fig. 5(b)) Kim et al teaches that the low pressure plasma jet has a lower temperature, higher velocity, and lower density than a plasma jet at atmospheric pressure, (p. 856, left col., para. 1, lines 5-11), and has a larger radius and length with less heat losses than a plasma jet at atmospheric pressure. (p. 857, left col. para. 1, lines 1-11)

39. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by generating the plasma stream at a pressure below atmospheric pressure as taught by Kim et al, because this would give a plasma stream with a lower temperature, higher velocity, and lower density than a plasma jet at atmospheric pressure, (see Kim et al, p. 856, left col., para. 1, lines 5-11) and has a larger radius and length with less heat losses than a plasma jet at atmospheric pressure. (see Kim et al, p. 857, left col. para. 1, lines 1-11)

40. Regarding claims 33 and 60, Kim et al teaches that the plasma jet (and therefore the chamber) may be at a pressure of 133 mbar (i.e. 1.333×10^4 Pa). (p. 855, left col., Fig. 5(b)) A specific example in the prior art that is within a claimed range anticipates the range. See MPEP 2131.03(I). Kim et al teaches that the low pressure plasma jet has a lower temperature, higher velocity, and lower density than a plasma jet at atmospheric pressure, (p. 856, left col., para. 1, lines 5-11), and has a larger radius and length with less heat losses than a plasma jet at atmospheric pressure. (p. 857, left col. para. 1, lines 1-11)

41. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by generating the plasma stream at a pressure of 133 mbar as taught by Kim et al, because this would give a plasma stream with a lower temperature, higher velocity, and lower density than a plasma jet at atmospheric pressure, (see Kim et al, p. 856, left col., para. 1, lines 5-11) and has a larger radius and length with less heat losses than a plasma jet at atmospheric pressure. (see Kim et al, p. 857, left col. para. 1, lines 1-11)

42. Claims 27-32 and 54-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahawili in view of Aardahl (US 7,220,396 B2).

43. Regarding claims 27 and 54, Mahawili is applied as above.

44. Furthermore, Aardahl et al also teaches that the source of ions may comprise water. (col. 5, lines 9 and 24) Aardahl et al teaches that this allows absorption of heat generated by the exothermic reduction reaction and reduction of the PFC gas. (col. 3, lines 14-31)

45. Regarding claims 28 and 55, Mahawili is applied as above.

46. Furthermore, Aardahl et al teaches that the source of ions may comprise an alcohol selected from the group consisting of methanol, ethanol, propanol, propan-2-ol and butanol. (col. 5, lines 25-27) Aardahl et al teaches that this allows absorption of heat generated by the exothermic reduction reaction and reduction of the PFC gas. (col. 3, lines 14-31)

47. Regarding claims 29 and 56, Mahawili is applied as above.

48. Furthermore, Aardahl et al also teaches that the source of ions may comprise a hydrogen-containing compound selected from the group consisting of hydrogen gas, a hydrocarbon, ammonia, and a paraffin. (col. 5, lines 6-10 and 25-31) Aardahl et al teaches that this allows absorption of heat generated by the exothermic reduction reaction and reduction of the PFC gas. (col. 3, lines 14-31)

49. Regarding claims 30, 31, 57, and 58, Mahawili is applied as above.

50. Mahawili is silent as to the temperature of the chamber.

51. Aardahl et al teaches that the chamber is at a temperature in the range from ambient to 1200°C, and that the chamber may be at ambient temperature (where the Examiner is construing ambient temperature to be e.g. less than or equal to about 100 °C). (col. 8, lines 19-31 and col. 24, lines 55-56)

Prior art disclosing a range overlapping the claimed range anticipates the claimed range when the reference discloses a range with sufficient specificity. See MPEP 2131.03(II). Aardahl et al teaches that controlling the temperature of the reactor in the range from ambient to 1200°C, and where the chamber is at ambient temperature, diminishes corrosive effects of the gas phase reduction products as compared to the conventional combustion process. (col. 3, lines 17-23)

52. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili et al by controlling the chamber temperature to be in the range from ambient to 1200°C, or to be at ambient temperature, as taught by Aardahl et al, because this would diminish corrosive effects of the gas phase reduction products as compared to the conventional combustion process. (see Aardahl, col. 3, lines 17-23)

53. Regarding claims 32 and 59, Mahawili is applied as above.

54. Mahawili is silent as to the temperature of the chamber.

55. Aardahl et al teaches that the chamber may be at a temperature in the range from 400°C to 1000°C. (col. 8, lines 19-31) Prior art disclosing a range overlapping the claimed range anticipates the claimed range when the reference discloses a range with sufficient specificity. See MPEP 2131.03(II). Aardahl et al teaches that controlling the temperature of the reactor in the range from ambient to 1200°C, and where the chamber is at ambient temperature, diminishes corrosive effects of the gas phase reduction products as compared to the conventional combustion process. (col. 3, lines 17-23)

56. Claims 34, 35, 61, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahawili in view of Yi et al.

57. Regarding claims 34, 35, 61, and 62, Mahawili is applied as above.

58. Mahawili does not explicitly teach that the step of conveying into the chamber the source of ions further comprises conveying the source of ions over a catalyst.

59. Yi et al teaches that the step of conveying into the chamber the source of ions further comprises conveying the source of ions over a catalyst, wherein the catalyst comprises a metal selected from the group consisting of tungsten, silicon, iron, rhodium, and platinum. (col. 4, lines 24-32 and col. 6, lines 50-54) Yi et al teaches that this allows treatment of fluorinated compounds (col. 4, lines 5-6) by a non-

thermal plasma without arcing, i.e. generating a stable non-thermal plasma at low cost and with enhanced efficiency of treatment. (col. 2, lines 59-64)

60. Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Mahawili by conveying the source of ions over a catalyst, wherein the catalyst comprises a metal selected from the group consisting of tungsten, silicon, iron, rhodium, and platinum, as taught by Yi et al, because this would allow treatment of fluorinated compounds by a non-thermal plasma without arcing, i.e. generating a stable non-thermal plasma at low cost and with enhanced efficiency of treatment. (see Yi et al, col. 4, lines 5-6 and col. 2, lines 59-64)

Response to Arguments

61. The 112 paragraph 2 rejections are withdrawn.

62. Applicant's arguments with respect to claims 1, 2, 4, 6-16, 18, 20-25, 27-52 and 54-65 have been considered but are moot in view of the new ground(s) of rejection. The Mahawili reference is now used to provide the step of injecting the plasma stream through an aperture in one of the electrodes. The Bhatnagar and Aardahl references are currently relied on as secondary references to teach limitations not explicitly taught by Mahawili.

Conclusion

63. Claims 1, 2, 4, 6-16, 18, 20-25, 27-52 and 54-65 are REJECTED. Claims 39-48 are WITHDRAWN as subject to a restriction requirement. Claims 3, 5, 17, 19, 26, and 53 are CANCELLED.

64. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 3,536,885 (Plasma torch assemblies); US 3,983,021 (Nitrogen oxide decomposition process); US 5,418,430 (Plasma generator with field-enhancing electrodes).

65. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH

shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLLEEN M. RAPHAEL whose telephone number is (571)270-5991. The examiner can normally be reached on Monday-Friday, 9:30 a.m. to 6 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. R./
Examiner, Art Unit 1724
November 4, 2011

/Keith D. Hendricks/
Supervisory Patent Examiner, Art Unit 1724